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in the late afternoon, the second reversal would be brought about. The down-valley current would then set in, taking the smoke back with it.

To the writer who was at the time engaged in the topographic survey of the valley this daily smoke invasion was, it may be imagined, a source of no little annoyance; for, while it lasted, it precluded all long-distance graphic triangulation across the valley, the only means whereby the host of peculiar cliff details, so characteristic of the Yosemite Valley, could be located. Nor was it a matter of a day or two; with a provoking regularity rendered possible only by the general absence of disturbing winds and cloudy skies, typical of the region, it continued for four long months with scarce an interruption.

No doubt intimately related to the rhythmic reversals of the lengthwise air current is the period of placidity of Mirror Lake. The surprised and usually vexed tourist who finds he must get up an hour before sunrise if he wishes to see the mirror at its best, little suspects that what he has undertaken to do really amounts to keeping an appointment with the early-morning reversal of the air current, and that punctuality on his part is vital because of the almost momentary briefness of the phenomenon. Yet such is actually the case. The stillness of the water surface sets in as the down-valley draft dies out; but as soon as a sufficient amount of cliff surface has been insolated in Tenaya Canyon, the upward movement becomes general, and a faint tremor once more steals over the lake. That its placidity is less perfect with the afternoon reversal is probably due to the relative suddenness with which that reversal takes place and the almost immediate strength of the downward currents in a narrow steep-walled chasm like Tenaya Canyon.

There is a certain appropriateness, finally, in likening the nocturnal down-valley current to a stream. For not only does it follow the bottom of the valley trough as a channel, but it also receives tributaries from the side valleys. In the case of the Yosemite Valley, the parallel is the more complete, as each trib-

utary air current literally plunges, water-fall-like, from the mouth of its hanging valley. Few visitors to the valley, probably, are aware of the existence of these—shall we call them “air-falls”?—nevertheless they are by no means imaginary, as one may readily find out to his satisfaction by ascending either the Yosemite Falls trail or the Nevada Falls trail in the evening. The writer had occasion to do so many times in returning to his high-level camps above the valley, and the unpleasant memory of the chilling down drafts that poured upon him on these evening trips has not yet lost its vividness.

FRANÇOIS E. MATTHES

WASHINGTON, D. C.

THE EFFECT OF ASPHYXIA ON THE PUPIL¹

OVER a year ago I reported² that CO₂ gas produced a practically maximal constriction of the pupil, both in the intact frog and in excised bulbi, and I stated that this behavior of the frog's iris was interesting because asphyxia in mammals produces chiefly dilatation. This latter statement gave surprise to Drs. C. C. Guthrie, F. V. Guthrie and A. H. Ryan and they write in a recent issue of *SCIENCE*³ that “in all animals observed, only momentary or no dilatation of the pupil occurs during the first stage of rapid asphyxia (. . .), and that as a rule a *very marked constriction* of the pupil occurs during this stage.” It must be noted that these authors speak only of the *first* stage of asphyxia, the stage of hyperpnœa, and do not mention at all the second and third stages, where true asphyxia has developed. Had they pushed their experimental investigations a little farther, they would have found the marked dilatation of the pupil which occurs in mammals during the second and third stages of asphyxia. This well-known dilatation of the pupil is more pronounced and

¹ A reply to Drs. C. C. Guthrie, F. V. Guthrie and A. H. Ryan. (From the department of physiology and pharmacology of the Rockefeller Institute.)

² *Amer. J. of Physiol.*, 1908, XXIII., p. xvi; see also report of a demonstration, *Proc. of the Soc. for Exp. Biol. and Med.*, 1908, VI., p. 49.

³ *SCIENCE*, March 11, 1910, XXXI., p. 395.

more lasting than the transitory initial pupillary constriction, and for this reason I said in my brief notes that the mammalian pupil shows "chiefly" dilatation during asphyxia.

From the above it will be seen that there was no occasion for the surprise nor the original communication of Drs. Guthrie, Guthrie and Ryan.

JOHN AUER

THE ROCKEFELLER INSTITUTE
FOR MEDICAL RESEARCH

FREE PUBLIC MUSEUMS

IN an interesting note in the February 11, 1910, copy of *SCIENCE*, Mr. Baker calls attention to the commendable policy of the Chicago Academy of Sciences, while commenting on Mr. Ward's statement of the liberal practise at the Milwaukee Public Museum, of having its museum open freely to the public, and shows that while the Milwaukee institution has been free to the public since 1905, the Chicago Academy of Sciences has been following that plan since 1894.

The Illinois State Museum of Natural History has been accessible to the public without charge for the last half century, thus preceding the afore-mentioned museums in this good work by many years. It now remains to hear from some museum which has been free to the public for a century.

Doubtless the time is speedily approaching when museums will be as free and as accessible as our libraries. The hours during which museums are commonly open, from nine to five, should doubtless be extended in order that working people might be accommodated. With the disappearance of the candle light period there is no insurmountable obstacle toward making the museums as attractive during the evening hours as during the day time.

The Illinois State Museum is visited possibly more largely by the people from the surrounding villages and towns than by the citizens of Springfield. Previous to the last four months the number of visitors were simply estimated, but during the last three months count has been kept and the number has averaged about 1,500 monthly. The highest at-

tendance was recorded during the first week in last October, when within five days 11,866 people visited the museum.

When the state properly cares for this institution which has had so long and useful a history, and which has a mission of untold value to perform, it will be extensively patronized and amply justify the expenditure necessary to make it one of the most valuable of the free public institutions in the state.

A. R. CROOK

FACTS VS. THE ADVANCEMENT OF SCIENCE

IN his vice-presidential address before Section L, Professor Dewey took as his text the failure of science teaching to fulfill the prophecies of its priests; and he referred this failure to the custom of teaching science as information rather than as that method of using the mind which is necessary for the manufacture of knowledge. Both elements are essential parts of science; it is, however, important that we keep clearly in mind which aspect we mean when we speak of science-teaching, or of the advancement of science.

We all know that there can be no true science that does not rest solidly upon facts. But the thought must often occur to many of us that there is some danger, especially among the younger scientists, that we may become obsessed with an exaggerated sense of the value of facts as such. Is there not too much emphasis laid by many professors in charge of research students on the mere accumulation of observational, statistical or experimental facts, with too little attention to that side of science which concerns itself with those analytical and synthetic processes that convert facts into valuable ideas? It seems to me that this latter kind of work needs at the present time at least as much encouragement as the other. Of course, there is the possibility for "thinking" to degenerate into profitless speculation; but we are certainly as much in need of the results of thinking about the facts already accumulated as we are of more facts.

It was especially noticeable at the meeting of the association that the younger men pre-